

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/017891

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ H01L31/0328, H01L31/115

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ H01L31

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2005
Kokai Jitsuyo Shinan Koho	1971-2005	Jitsuyo Shinan Toroku Koho	1996-2005

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	Yutaro NAKANISHI et al., 'MOVPE-ho ni yoru GaAs Kibanjo CdTe Komaku Seichoso no Denki Tokusei Hyoka', The Institute of Electronics, Information and Communication Engineers Gijutsu Kenkyu Hokoku, Vol.103, No.50, pages 81 to 85, 15 May, 2003 (15.05.03)	1-2 3-18
X Y	Yusuke MASUDA et al., 'MOVPE Seicho CdTe eno Hiso Doping Tokusei', The Institute of Electronics, Information and Communication Engineers Gijutsu Kenkyu Hokoku, Vol.101, No.82, pages 13 to 18, 24 May, 2001 (24.05.01)	1 2-18
X Y	K. YASUDA et al., "MOVPE growth of (100) CdZnTe layers using DiPZn", Journal of Crystal Growth 159 (1996), pages 121 to 125	1 2-18

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
17 February, 2005 (17.02.05)Date of mailing of the international search report
08 March, 2005 (08.03.05)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	Kei UCHIDA et al., 'MOVPE-ho ni yoru Daimenseki CdTeX-sen·γ-sen Gazo Kenshutsuki ni Kansuru Kenkyu (VII)', Dai 64 Kai Extended abstracts; the Japan Society of Applied Physics, No.1, page 245, 30 August, 2003 (30.08.03)	1 2-18
X Y	W.S. WANG et al., "(100) or (111) heteroepitaxy of CdTe layers on (100) GaAs substrates by organometallic vapor phase epitaxy", Materials Chemistry and Physics, 51 (1977), pages 178 to 181	1 2-18
X Y	G. Leo et al., "Influence of a ZnTe buffer layer on the structural quality of CdTe epilayers grown on (100) GaAs by metal organic vapor phase epitaxy", Journal of Vacuum Science & Technology B: May/June 1996, Vol.14(3), pages 1739 to 1744	1 2-18

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

A heterojunction type diode detector obtained by growing a CdTe thick film on n⁺GaAs substrate is disclosed in, for example, the literature by inventor of this application listed on page 2 of this report, Yutaro Nakanishi et al., "Evaluation of the electrical properties of CdTe thick film growth layer on GaAs substrate according to MOVPE technique", The Institute of Electronics, Information and Communication Engineers Gijutsu Kenkyu Hokoku, Vol.103, No.50, pp.81-85, 2003.5.15. Consequently, claim 1 falls within the category of state of art at the priority date of this application. From this viewpoint, it appears that claim 2 (featuring pn junction), claims 3-5 (featuring equipment with intermediate growth layer, surface layer or (continued to extra sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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Continuation of Box No.III of continuation of first sheet (2)

shot key electrode), claims 7-9 (featuring two-dimensional arrangement configuration) and claims 10-18 (featuring sticking of arsenic onto Si substrate) have respective different "special technical features" (PCT Rule 13.2).